




my comments 
Audrey Asher to: Dan Gravatt

01/30/2013 08:59 AM

see if you can click on my comments that are embedded.



AudreyEditsWest Lake draft SFS briefing for Locals.pptx

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Superfund

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The West Lake Landfill OU-1 Supplemental Feasibility Study



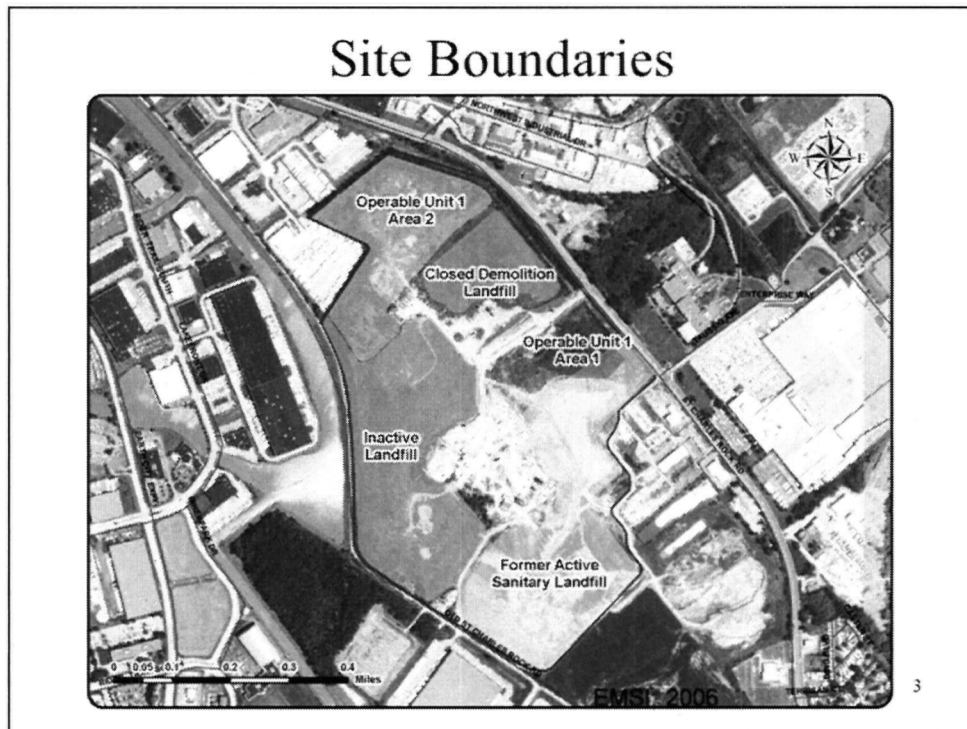
**Dan Gravatt
U.S. Environmental Protection Agency
Region 7**

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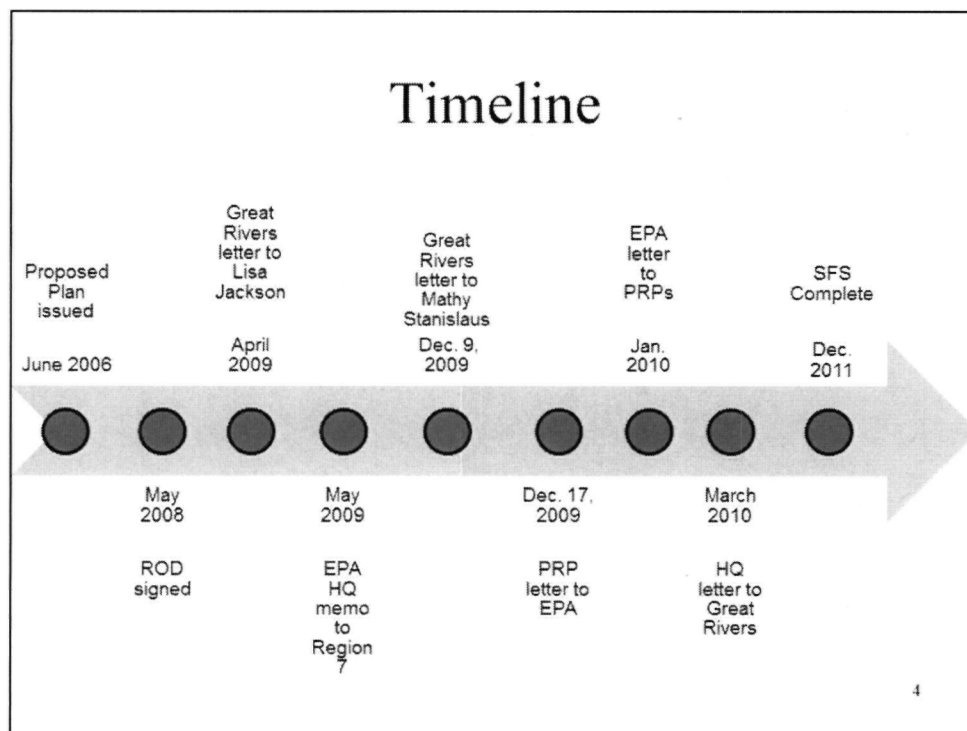
Final SFS received October 3, 2011.



Water intake about 8 miles downstream of Earth City, serves St. Louis County.
Note proximity of airport.



Point out major features: OU 1 and 2, active transfer station and other businesses, trailer park, Spanish Village, “vineyard”, flood control channel, Ford property, rail lines. All cells covered by airport’s negative easement.



Site is PRP-lead. OU1 PRPs include Bridgeton Landfill LLC, Rock Road Industries, Cotter Corporation, and US DOE. OU2 PRP is Bridgeton Landfill LLC.

Emphasize cooperation between HQ, R7, OGC, program, state, everybody.

Great Rivers Environmental Law Center was hired by the Missouri Coalition for the Environment, an activist group that is involved in numerous environmental issues throughout the state, not just Westlake. Kay Drey is on GRELC's board of directors.

1st Bullet: Proposed Plan for the containment remedy issued June 12, 2006

First public comment period opened June 14, 2006. After several extensions, it ended December 29, 2006 (open more than 6 months)

Two public meetings were held during this period: June 22, 2006 and September 14, 2006

In response to further comment on the levee system and floodplain issues, EPA reopened the public comment period and held a third public meeting on March 27, 2008.

The second comment period closed April 9, 2008

Responsiveness summary is epic in its length and detail. Main opposition from Kay Drey and GRELC. Main objections include "it's in a floodplain" "drinking water intakes several miles downstream" "super-hot belgian congo ore" "plume migrating to river" "earthquake risk" "no liner" "NRC report recommends disposal cell" "nearby FUSRAP/SLAPS sites are being dug up" "USACE should take over the site"

2nd Bullet: Proposed Plan sent to HQ for review in June 2006

Draft ROD sent to HQ for review in September 2007 (extensive comments received)

Region traveled to DC for meeting with HQ in November 2007 (resolutions identified)

Revised ROD resubmitted and approved in February 2008

ROD signed by Region in May 2008

4th Bullet: The HQ re-review wasn't called a Remedy Review Board, but basically did what an RRB would do.

Recommendations in the May 21, 2009 memo from Betsy to Cecilia. HQ SUPR and rad experts from Assessment and Remediation Division, and ORIA re-reviewed the site remedial studies and the May 2008 ROD. They proposed several minor enhancements to the selected remedy in the ROD: 1000-year design life from UMTRCA; on- and off-site air monitors for rads; groundwater monitoring at cell boundary and off-site downgradient; and cover design should include flood control measures for 500-year flood, assuming that the levee system will fail. This means that ROD remedy is NOT dependent on integrity of levees. Region agreed to adopt all recommendations.

5th bullet: The 12/09 letter is the one that talks about the “Bush-Era” ROD, claims the ROD would set a bad precedent, and again references the Shattuck Facility remedy in Denver, where rad soil was initially solidified but then removing the material for offsite disposal.

6th bullet: PRPs ask for and receive EPA approval to perform the SFS under the existing AOC, after EPA initially planned to do the SFS internally using contractor support.

How West Lake Landfill became radiologically contaminated

- Manhattan Project work in St. Louis (Mallinckrodt)
- 8,700 tons leached barium sulfate cake (uranium 0.03% - 0.1%) left over after other, more valuable ore residues sent to Colorado for reprocessing
- Uranium concentrations and leach potential too low for commercial reprocessing
- Mixed with 39,000 tons of soil
- Given to the municipal solid waste landfill and used as daily and intermediate cover at OU-1 Areas 1 and 2
- Contaminated soil was placed between July and October 1973

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Emphasize 4th bullet when you do this slide, 8700 tons Rad waste mixed with 39,000 tons of uncontaminated soils. This is based on info we obtained from NRC Report?

Operable Unit 1

- Operable Unit 1 received municipal solid waste, construction and demolition debris, and industrial wastes, as well as the radiological contamination
- Operated from approximately 1950 to 1974
- Buffer Zone/Crossroad Property (Ford Property) became radiologically contaminated by erosion from OU-1
- Areas 1 (10 acres) and 2 (30 acres) of OU-1 are part of the overall 200-acre MSW landfill

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Site is PRP-lead. OU1 PRPs include Bridgeton Landfill LLC, Rock Road Industries, Cotter Corporation, and US DOE. OU2 PRP is Bridgeton Landfill LLC.

OU-1 landfilling ceased in 1974 but landfilling went on in OU2 cells until 2005 when negative easement placed.

Operable Unit 2

- Operable Unit 2 received municipal solid waste and construction and demolition debris
- No radiological contamination
- Operated from the 1950s until 2005
- Two of the three OU-2 cells are now being managed by the State of Missouri, including the cell with the subsurface fire

Who is managing the 3rd cell?

Distribution of the Radiological Materials in OU-1

- The Nuclear Regulatory Commission did studies in the 1980s.
- The PRPs did a Remedial Investigation in the 1990s.
- Radiological materials were found from zero to 17 feet deep in Area 1 and zero to 42 feet deep in Area 2. The RAD materials are mixed with trash and construction debris.

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Bottom line: differences between RI and NRC characterization of distribution of rads within MSW is due to the RI using a much more extensive data set (more lateral, vertical, and analyte coverage) than the NRC had to work with. Thus the RI description of the distribution is a refinement and extension of the NRC description. The greater level of detail available in the RI proves that the rads are not in a contiguous, well defined layer within the MSW.

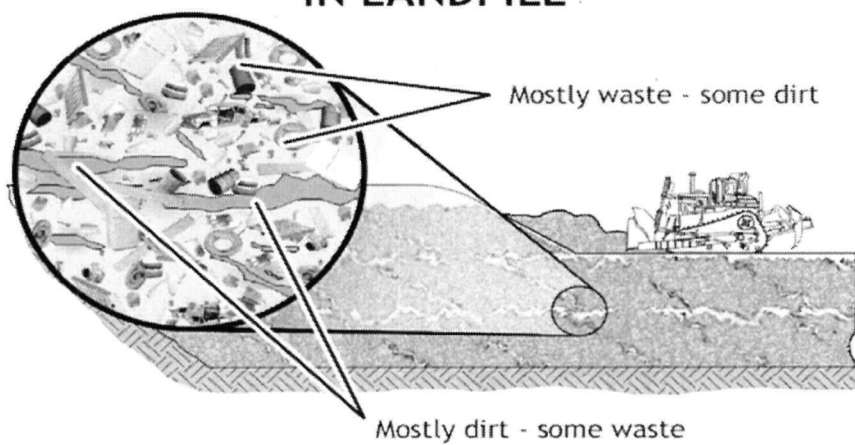
Both NRC and RI data were used within the SFS to define the 3-D extent of rads within MSW.

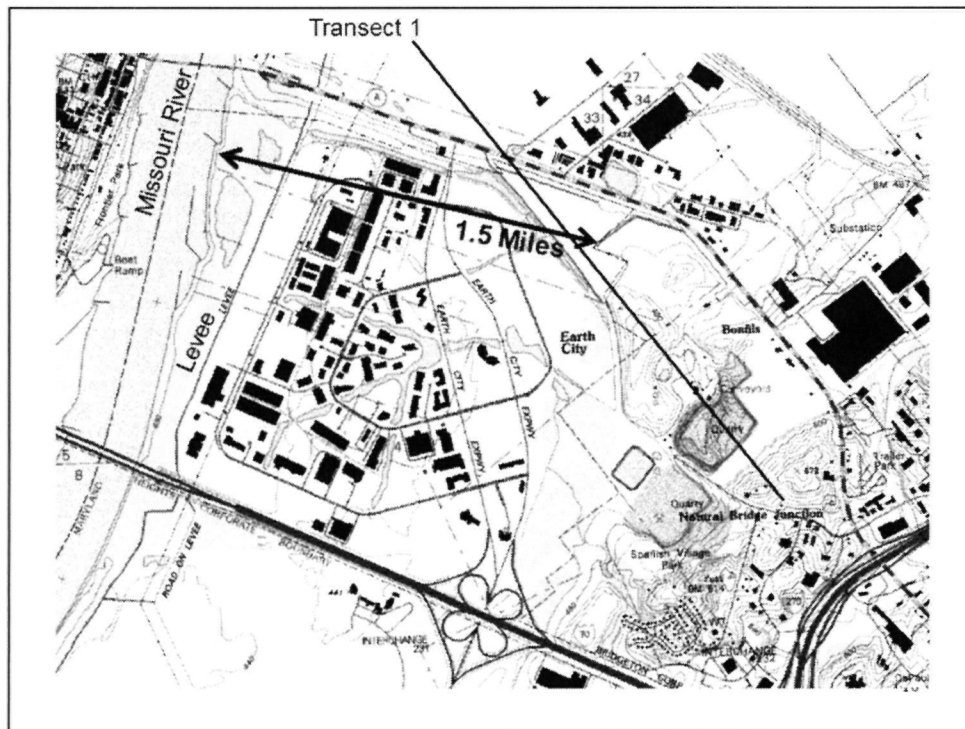
All NRC borings were scanned with NaI detectors; only a subset were gamma-logged and/or sampled for lab analysis.

Slide 8

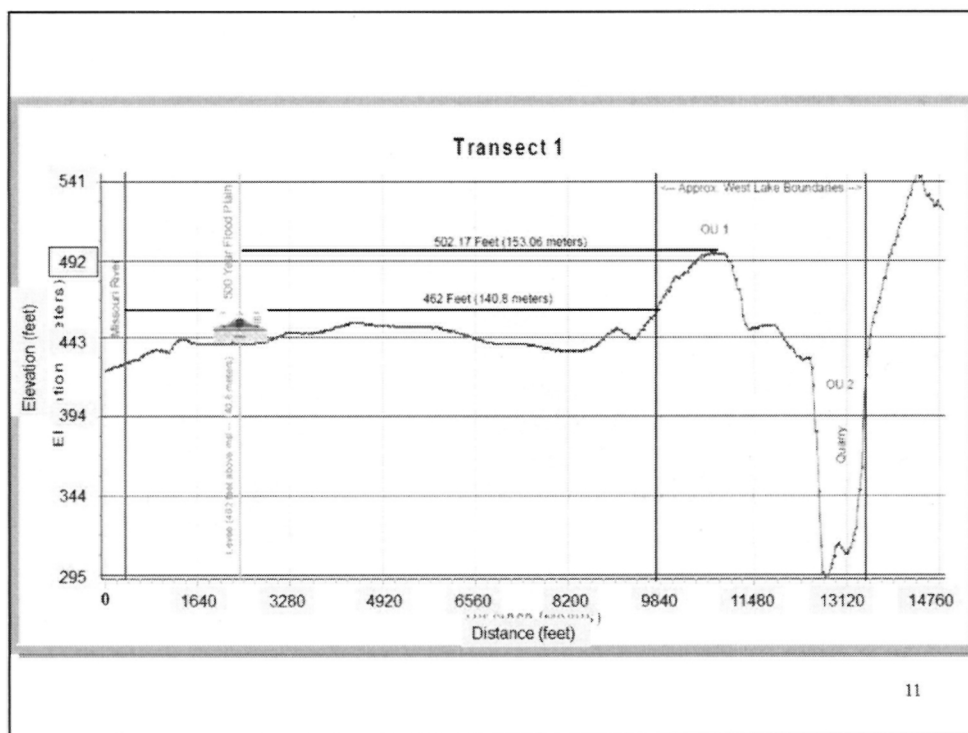
- R71** I deleted "some"
REGION 7, 1/30/2013
- R72** I created two sentences.
REGION 7, 1/30/2013
- R73** Last statement in comment -- will the SFS final memo contradict this? Should you soften, instead of "prove", say "supports the conclusion that..."
REGION 7, 1/30/2013

TYPICAL MIXING OF WASTE AND DIRT IN LANDFILL





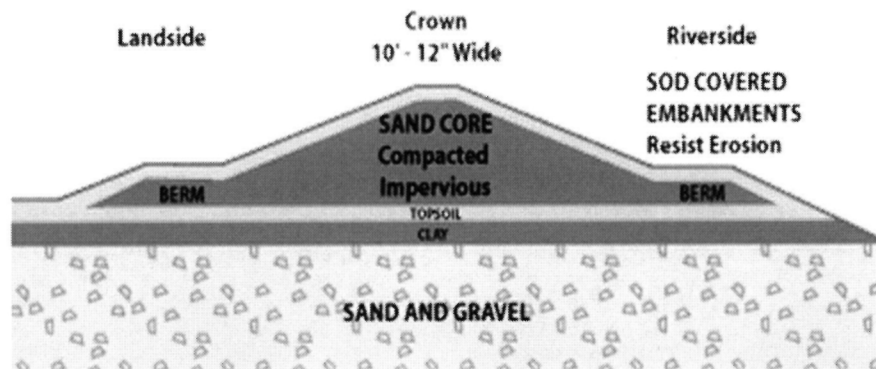
St. Charles, MO 7.5' quadrangle 1994. Contour interval 10 feet. 430' contour along river, 480' contour marked on OU2 cell. Levee is 459.34' high at north end and 462.03' high at south end. Note positions of trailer park and Spanish Village.



Make point clearly here that the protectiveness of the ROD remedy does NOT depend on the integrity of the Earth City levee, because the landfill is almost entirely higher than the levee, and the landfill is approximately 1.5 miles from the Missouri river. Draw parallels to experience of Katrina landfills here, from the 3rd public meeting presentation.

Three Lines of Defense for OU1:

- The levee has never been breached or overtopped; the levee district's mission is protecting the \$1B industrial park
- Rock armoring of toe of Area 2 cap in case levee fails in the future
- Landfills flooded during Hurricane Katrina suffered little damage



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From the Earth City Levee District's website: (does not include 2011 flooding)

Four (4) major floods have occurred since the 2.6-mile, 500-year earthen levee was completed in September, 1972. A major flood is when the water level in the Missouri River is at a minimum of 10 feet above flood stage for at least one week.

During the four (4) major floods, the District's flood control system sustained minimal damage that was quickly repaired.

Spring 1973 and fall of 1986: Crest elevations were under the 50-year flood level. The 1973 flood stage lasted about 75 days. This is significant as at this time, the 500-year levee was only six months old. The 1986 flood was higher than the 1973 flood but of a relatively short duration.

August, 1993: During this record level flood, the Missouri River crested at 14.6 feet above flood stage on August 2, and remained above flood stage for about 110 days. It has been estimated that at its August 2 crest, the Missouri River was at a 200-year flood level. The levee and the other components of the District's flood control system successfully resisted the flood.

May, 1995: the Missouri River crested at 11.7 feet above flood stage but the flood duration was relatively short.

Since the 500-year levee was completed in September, 1972, in addition to the four major floods, the Missouri River has been over flood stage numerous

times --usually at a level less than 5 feet over flood stage. These are normal events.

Groundwater at the Site

- 44 monitoring wells installed in and around OU-1 during the Remedial Investigation
- No plumes of radioisotopes or other contaminants identified during the RI
- Isolated detections of radium, arsenic, lead, benzene and chlorobenzene above their respective Maximum Contaminant Levels
- Sampling in 2012 identified additional detections in wells not sampled before

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Total and dissolved radium results only slightly exceeded MCL of 5 pCi/L, max was 7.75 pCi/L. Five total locations with radium exceedences; all deep (bedrock), some far to the south of OU-1 with questionable relation to OU-1. Possible naturally-occurring background radium in limestone bedrock contributing to some results. NO uranium exceedences of the 30 ug/L MCL.

Note that radionuclides are fairly insoluble, strongly sorb to solids and especially organics, and are essentially immobilized by sorption to the MSW.

Slide 13

- R74** Preface comments with statement, "we realize there is concern that RAD wastes may already be present in the gw and moving into the MO River. Here are some facts:
REGION 7, 1/30/2013

Remedial Action Objectives

- Prevent direct contact with landfill contents including exposure to external radiation
- Minimize infiltration and any resulting contaminant leaching to groundwater
- Control surface water runoff and erosion
- Control and treat landfill gas emissions including radon
- Move contaminated soil from the Buffer Zone into Area 2 cell prior to capping

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There are no cleanup standards for the ROD remedy as there is no soil impact or groundwater plume. Only impacted medium is the MSW. The RAOs reduce risk to levels well within the target risk range by isolating the waste from the environment and people, trapping radon until it decays and shielding against direct gamma exposure or “ground shine”. Preventing further infiltration of water will prevent future generation of leachate, further reducing the risk of any future groundwater impacts (after 30+ years without a proper cap, there is no groundwater plume).

Key ARARs include UMTRCA (as a TBC for Areas 1 and 2, but applicable to the buffer zone), MDNR landfill regs (cap design and grading), and Executive Order 11988, 40 CFR 6.302(b) and the Missouri Governor’s Order 82-19 relative to floodplain management.

Remedies evaluated in the SFS

- The SFS re-evaluates the cap-in-place remedy and the complete excavation and off-site disposal remedy *in greater detail* than was done in the original Feasibility Study.
- The SFS also includes an evaluation of complete excavation and on-site disposal of radiologically-contaminated material; this was not previously evaluated.

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Only potential cell location outside the geomorphic floodplain is also closest to the adjacent residents, with potential EJ concerns and/or impacts. It is also well within 10,000 feet of the airport runway.

EPA HQ OGC pushing for a determination that PTW is present, based on their new interpretation of the PTW guidance.

EPA HQ OGC wants SFS to very clearly and explicitly state whether NRC was “right or wrong” in their conclusions, and clearly and explicitly explain the differences in the NRC vs. RI/FS conclusions. They believe NRC is entitled to deference as the “expert” on rad issues, and if we contradict their conclusions we need ironclad explanations.

Cap-in-Place (ROD Remedy)

- Re-grade the waste in place to establish positive drainage for stormwater
- Cover with multi-layered cap of compacted clay and rip-rap (boulders) about 5 feet thick
- Groundwater sampling and cap maintenance
- Costs \$41.4 million
- 3 years to construct

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At \$10M/yr, takes five years to complete.

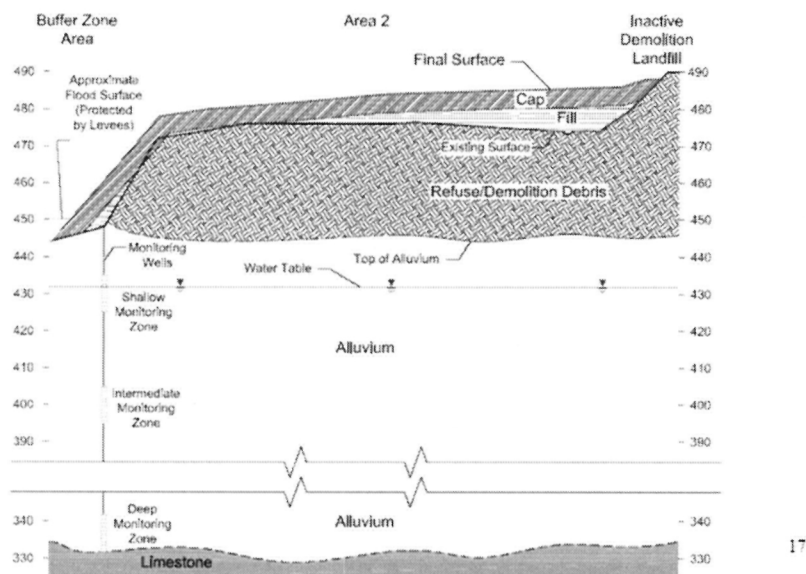
Note that there is not a groundwater plume at the site, and that OM&M for an indefinite time period is part of the remedy, including five year reviews that could trigger modifications to the remedy if GW contamination (or other unexpected conditions) were found in the future. There will be no separate “groundwater ROD”.

Discuss details of effectiveness and implementability assessments, if needed.

Slide 16

R75 instead of "sampling", shouldn't we say "monitoring" to indicate it is an ongoing.
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Cross section of Landfill and Cap



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Excavation and Off-Site Disposal Alternative

- Excavate all radiologically-contaminated material above background levels
- Transport by truck and railcar to permitted disposal facility in the Western US
- Re-grade remaining non-radiological trash and cap it in place
- Groundwater sampling and cap maintenance
- Costs \$259 to \$415 million
- 4 years to complete

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At \$10M/yr, takes 26+ years to complete, minus \$40M payout

Briefly discuss problems with short-term effectiveness and implementability – Airport's environmental covenant, bird strike issues, intersection with OU2 cells, dust/odors, etc. Later slide will go into more detail.

Slide 18

R76 and length of time that landfill will be dug up and portions exposed.
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Excavation and On-site Disposal Alternative

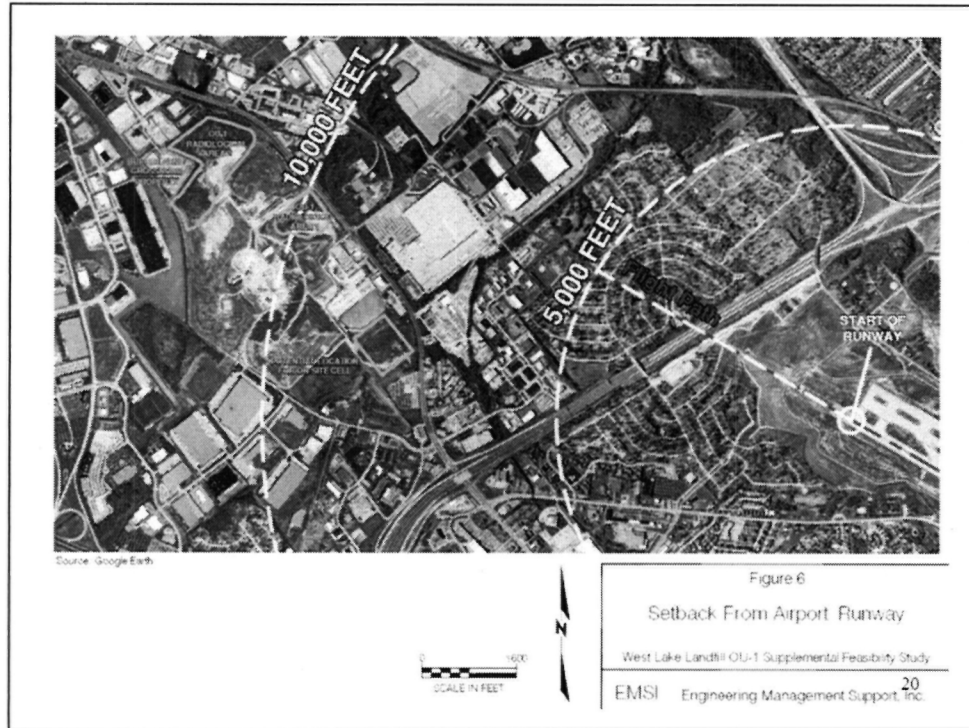
- Excavate all radiologically-contaminated material above background levels
- Construct new lined disposal cell on the south-eastern end of the site and fill with excavated radiological material
- Cap the new disposal cell and the remaining non-radiological trash in place
- Groundwater sampling and cap maintenance
- Costs \$137 million
- 6 years to complete

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Emphasize at this point that the SFS *does not* select or recommend one of these three alternatives; it simply provides the detailed analysis that will be used later by EPA / MDNR to prepare a new Proposed Plan leading to an ESD or other decision document.

At \$10M/yr, takes 13 years to complete, minus \$40M payout

Does not meet State ARAR (10 CSR 80-3.010[3][A][2]) prohibiting disposal of rad waste in permitted solid waste landfills.



Implementation Issues

- Noise, dust, odor and vapor exposure for nearby residents and businesses
- Bird strike mitigation for aircraft
- Contaminant migration concerns during excavation
- Waste hauling and transportation issues
- Schedule and cost considerations
- Airport easement prevents new landfill activity at the site

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Airport paid landfill to stop landfilling in 2005; easement required as part of Airport ROD for new runway. Easement prevents further landfilling anywhere on site, not just the cell which was active and closed in 2005. Airport briefed on the two SFS excavation alternatives in September 2010 and wrote letter strongly opposing both due to increased risk of bird strikes. Legal analysis of this issue by EPA determined that the courts will have to decide the issue of whether the FAA ROD or EPA ROD has primacy.

The short-term risks during construction, just from transporting the RIM to an off-site disposal facility, are greater than the long-term risks calculated for current and future receptors under a cap-in-place remedy. This does not include the short-term risks due to rad exposure by workers, potentially spreading the RIM around, and/or creating a groundwater plume. Remember that the SLAPS sites were contaminated due to storing and moving around the BaSO₄ cake from SLDS to Latty avenue, so the more we move RIM, the more we spread it.

Excavation footprints would intersect OU2 cells, require extensive sloping, making any portable enclosures (requested by GRELC and Kay Drey) impracticable. Even bird “mesh” over excavations will be difficult to implement, for all remedies.

Fugitive dust, Odors – airborne migration

Fugitive dust control – water application

Spills and accidents

Leachate generation, Equipment decontamination water, and Water from open excavations

Exposed waste attracts vermin and birds. Possible wire mesh over excavations to deter birds.

Tarps/foam/daily soil cover envisioned on open excavations and stockpiles; tanks for leachate.

Truck decontamination, Transfer facilities, Increased local truck traffic, Waste hauling on public roads, Interstate transit by rail

DOT requirements, Safety issues

Note that any dirt clod found on the truck haul route will be assumed to be radioactive, even if it came from Joe Blow's excavation service.

Some states charge fees for hauling rad waste through them! Missouri is one.

We're assuming we can use the SLAPS railspur to transfer from truck to rail. Another option is to build a railspur directly onto West Lake, across St. Charles Rock Road. Major space and implementability issues are possible with disruption of traffic to build this.

R7 legal analysis determined that ARARs are not yet frozen for this site as RD/RA has not yet begun. Can address changed MCLs, other new ARARs iff they are necessary for protectiveness.

EPA and HQ legal analysis of how or if EPA regs trump the airport easement prohibiting additional landfilling. EPA is a signatory to a 2003 MOA between FAA, USAF, USA, USFWS, USDA stating that all signatory agencies will work together to "more effectively address existing and future environmental conditions contributing to aircraft-wildlife strikes throughout the US." FAA has several orders and advisories restricting operation of landfills within 10,000' of runways handling jets. St. Louis airport doesn't care about 10,000' limit strictly; believes anywhere on the site is too close, and showed us a figure that most west-departing flights hang a left and head south directly over the landfill. We saw some of these during our site visit.

Human Health Risk Summary

- Short-term cancer risks to local residents and construction workers are lowest for the cap-in-place remedy, approximately ten times less than the risks for either of the excavation remedies
- Long-term cancer risks for local residents after remedy completion are similar for all three alternatives

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The RME individual for carcinogenic risks under the post-construction conditions is the grounds keeper working to maintain the cover for Area 2. The cancer risk estimate for this receptor is calculated to be 1.3×10^{-6} after 1,000 years of radium-226 in-growth from thorium-230 decay. The most important single contributor to this risk is exposure to radon daughters emanating from the continued in-growth of radium-226 from the decay of thorium-230 over the 1,000 year study period. Calculated risks to the on-site grounds keeper from the two areas are all within or below EPA's acceptable risk range as stated in the National Contingency Plan (NCP) (EPA 1990).

Note that current groundskeeper risk for work adjacent to Area 2 is 4×10^{-5} . Future groundskeeper work ON Area 2 is 2×10^{-4} . Future Area 2 storage yard worker risk is 4×10^{-4} . These values from BRA.

Reuse Issues

- Regardless of remedy selected, site will be a landfill for the foreseeable future; thus there is no intended reuse of the site
- Negative easement and zoning (both for site and Airport) prevent additional residences around the site

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Note “ghost town” between site and nearest airport runway; residents bought out as part of new runway project.

Future on-site receptors include workers at transfer station and other onsite businesses, and mowers/maintenance personnel on site a few days a year. Cap design in ROD remedy meets radon migration standard from UMTRCA and provides sufficient gamma shielding to protect receptors.

Summary of Alternatives

	Cap-in-Place	Excavation and Off-site Disposal	Excavation and On-site Disposal
Threshold Criteria	✓	✓	Does not meet all ARARs
Balancing Criteria	✓	Short-term effectiveness and implementability issues	Short-term effectiveness and implementability issues
Time to Complete	Three years	Four years	Six years
Cost	\$41.4M	\$259M to \$415M	\$137M

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Note 10 CSR 80-3.010 is the ARAR the on-site cell can't meet fully, specifically 3.010(3)(A)(2) which prohibits disposal of rad waste in a permitted solid waste landfill. SFS workplan says on-site cell design follows UMTRCA and MDNR solid waste regs (3.010) and therefore is not designed to Subtitle C standards.

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